

10/538201

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 June 2004 (24.06.2004)

PCT

(10) International Publication Number
WO 2004/052932 A3

(51) International Patent Classification⁷: **C07K 16/18**,
C12N 15/13, 15/85, 5/10, A61K 39/395

SCHWAB, Martin, E. [CH/CH]; Waffenplatz Strasse 79,
CH-8002 Zürich (CH). **VITALITI, Alessandra** [CH/CH];
6981 Bedigliora, CH- (CH). **ZURINI, Mauro** [CH/CH];
Benkenstrasse 92a, CH-4102 Binningen (CH).

(21) International Application Number:
PCT/EP2003/013960

(74) Agent: **GRUBB, Phillip**; Novartis AG, Corporate Intellec-
tual Property, CH-4002 Basel (CH).

(22) International Filing Date: 9 December 2003 (09.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0228832.2 10 December 2002 (10.12.2002) GB

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR,
CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,
LC, LK, LT, LU, LV, MA, MD, MK, MN, MX, NI, NO,
NZ, OM, PG, PH, PL, PT, RO, RU, SC, SE, SG, SK, SY,
TJ, TM, TN, TR, TT, UA, US, UZ, VC, VN, YU, ZA, ZW.

(71) Applicant (*for all designated States except AT, US*): **NO-
VARTIS AG** [CH/CH]; Lichtstrasse 35, CH-4056 Basel
(CH).

(84) Designated States (*regional*): Eurasian patent (AM, AZ,
BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE,
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

(71) Applicant (*for AT only*): **NOVARTIS PHARMA GMBH**
[AT/AT]; Brunner Strasse 59, A-1230 Vienna (AT).

(71) Applicant (*for all designated States except US*): **UNI-
VERSITÄT ZÜRICH** [CH/CH]; Prorektorat Forschung,
Rämistrasse 71, CH-8006 Zürich (CH).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **BARSKE, Carmen**
[DE/DE]; Birkenweg 10, 79540 Loerrach (DE). **MIR,**
Anis, Khuro [GB/FR]; Rue des Vosges 6, F-68870
Bartenheim (FR). **OERTLE, Thomas** [CH/CH]; Casa
al lago, CH-6576 Gerra/Gambarogno (CH). **SCHNELL,**
Lisa [CH/CH]; Schwanengasse 9, CH-8001 Zürich (CH).

(88) Date of publication of the international search report:
21 October 2004

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: ANTIBODY ("11C7") ANTI NOGO A AND ITS PHARMACEUTICAL USE

(57) Abstract: This invention relates to molecules, such as for example monoclonal antibodies or Fab fragments thereof, which are capable of binding to the human NogoA polypeptide or human NiG or human NiG- or human NogoA₆₂₃₋₆₄₀ with a dissociation constant < 1000nM; polynucleotides encoding such a binding molecule; an expression vector comprising such polynucleotides; the use of such a binding molecule in the treatment of nerve repair; a pharmaceutical composition comprising such a binding molecule; and to a method of treatment of diseases associated with nerve repair.

WO 2004/052932 A3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/13960

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K16/18 C12N15/13 C12N15/85 C12N5/10 A61K39/395
A61P25/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>MERKLER DORON ET AL: "Locomotor recovery in spinal cord-injured rats treated with an antibody neutralizing the myelin-associated neurite growth inhibitor Nogo-A"</p> <p>JOURNAL OF NEUROSCIENCE, vol. 21, no. 10, 15 May 2001 (2001-05-15), pages 3665-3673, XP002293416 ISSN: 0270-6474 page 3669, right-hand column, last paragraph - page 3672, left-hand column, last paragraph</p> <p style="text-align: center;">----- -/--</p>	1-18

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *Z* document member of the same patent family

Date of the actual completion of the international search

25 August 2004

Date of mailing of the international search report

03/09/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Le Flao, K

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/13960

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	POT CAROLINE ET AL: "Nogo-A expressed in Schwann cells impairs axonal regeneration after peripheral nerve injury" JOURNAL OF CELL BIOLOGY, vol. 159, no. 1, 14 October 2002 (2002-10-14), pages 29-35, XP002293417 ISSN: 0021-9525 page 33, right-hand column, paragraph 3	1-18
X	RAINETEAU O ET AL: "Improved locomotor recovery in spinal cord injured rats treated with the monoclonal antibody IN-1" SOCIETY FOR NEUROSCIENCE ABSTRACTS, vol. 27, no. 2, 2001, page 1833, XP001199820 & 31ST ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; SAN DIEGO, CALIFORNIA, USA; NOVEMBER 10-15, 2001 ISSN: 0190-5295 abstract	1-18
X	LI W ET AL: "NEUTRALIZATION OF MYELIN - ASSOCIATED NOGO - A BY A NOGO RECEPTOR - Fc FUSION PROTEIN." SOCIETY FOR NEUROSCIENCE ABSTRACT VIEWER AND ITINERARY PLANNER, vol. 2002, 2002, pages Abstract No. 333.2 URL-http://sf, XP001199824 & 32ND ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; ORLANDO, FLORIDA, USA; NOVEMBER 02-07, 2002 abstract	1-8
A	CHOI E D ET AL: "CHARACTERIZATION OF AN ANTI - NOGO RECEPTOR FAB THAT DISRUPTS NOGOA/NOGO RECEPTOR INTERACTION." SOCIETY FOR NEUROSCIENCE ABSTRACT VIEWER AND ITINERARY PLANNER, vol. 2002, 2002, pages Abstract No. 333.1 URL-http://sf, XP001199822 & 32ND ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; ORLANDO, FLORIDA, USA; NOVEMBER 02-07, 2002 abstract	1-18
X	EP 1 174 441 A (CT DE IMMUNOLOGIA MOLECULAR) 23 January 2002 (2002-01-23) claim 2	2-8

-/--

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/13960

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PAPADOPOULOS CATHERINE M ET AL: "Functional recovery and neuroanatomical plasticity following middle cerebral artery occlusion and IN-1 antibody treatment in the adult rat" ANNALS OF NEUROLOGY, vol. 51, no. 4, April 2002 (2002-04), pages 433-441, XP008034394 ISSN: 0364-5134 abstract	1-18
X	WO 01/51520 A (UNIV YALE ; STRITTMATTER STEPHEN M (US)) 19 July 2001 (2001-07-19) examples 2,6	1
A	PRINJHA R ET AL: "Characterisation and CNS localisation of Nogo and the Nogo-loop66 receptor" SOCIETY FOR NEUROSCIENCE ABSTRACTS, vol. 27, no. 1, 2001, page 670, XP001199821 & 31ST ANNUAL MEETING OF THE SOCIETY FOR NEUROSCIENCE; SAN DIEGO, CALIFORNIA, USA; NOVEMBER 10-15, 2001 ISSN: 0190-5295 abstract	1-18
A	WO 02/088306 A (LILLY CO ELI ; TSURUSHITA NAOYA (US); VASQUEZ MAXIMILANO (US)) 7 November 2002 (2002-11-07) sequences 2,3	2-8
P,X	WO 03/048083 A (REID CARL ; BIOGEN INC (US); GARBER ELLEN (US); DE FOUGEROLLES ANTONIN) 12 June 2003 (2003-06-12) figure 9	2-6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/13960

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claim 18 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/13960

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1174441	A	23-01-2002	AU 1513001 A	30-05-2001
			BR 0007827 A	30-10-2001
			CA 2359577 A1	25-05-2001
			EP 1174441 A2	23-01-2002
			JP 2003514831 T	22-04-2003
			CN 1344276 T	10-04-2002
			WO 0136485 A2	25-05-2001
			ZA 200105803 A	06-01-2003
WO 0151520	A	19-07-2001	AU 2940101 A	24-07-2001
			BG 106907 A	30-05-2003
			BR 0107613 A	19-11-2002
			CA 2397199 A1	19-07-2001
			CN 1404488 T	19-03-2003
			CZ 20022438 A3	16-10-2002
			EE 200200386 A	15-12-2003
			EP 1248803 A2	16-10-2002
			HU 0203863 A2	28-03-2003
			JP 2003519481 T	24-06-2003
			NO 20023387 A	11-09-2002
			SK 9992002 A3	02-05-2003
			WO 0151520 A2	19-07-2001
			US 2002012965 A1	31-01-2002
			US 2002077295 A1	20-06-2002
			ZA 200205403 A	20-01-2004
WO 02088306	A	07-11-2002	EP 1385545 A2	04-02-2004
			WO 02088306 A2	07-11-2002
WO 03048083	A	12-06-2003	CA 2468733 A1	12-06-2003
			WO 03048083 A2	12-06-2003